GRIFFIN INTERNATIONAL INC

August 18, 1999

Mr. Chuck Schwer
VT Department of Environmental Conservation
Waste Management Division
103 South Main St./ West Bldg.
Waterbury, VT 05671-0404

RE: Subsurface Investigation, Bushey's Sunoco, Essex Junction, VT,
(VTDEC #98-2430)

Dear Chuck:

Enclosed please find the August 1999 *Report on the Site Investigation of Suspected Subsurface Petroleum Contamination* for Bushey's Sunoco site in Essex Junction, Vermont. Ms. Sharon Abbott requested that we forward a copy to you. Please call if you have any questions or comments.

Sincerely,

Timothy J. Kelly, PG
Staff Geologist

Encl.

cc: Sharon Abbott
GI #119841413

P.O. Box 943 • Williston, VT 05495 • Phone 802-865-4288 • Fax 802-657-4129
59 Clinton Street • Plattsburgh, NY 12901 • Phone 518-562-4666 • Fax 518-561-6832

REPORT ON THE SITE INVESTIGATION OF SUSPECTED SUBSURFACE PETROLEUM CONTAMINATION

AT

BUSHEY'S SUNOCO
Essex Junction, Vermont

VTDEC Site #98-2430
Griffin Proj. #119841413

August 18, 1999

Prepared For:

Ms. Sharon Abbott
A.R. Sandri, Inc.
PO Box 1578
Greenfield, MA 01302-1578

Prepared by

P.O. Box 943
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TABLE OF CONTENTS

I. INTRODUCTION

This report provides a summary of the tasks completed for the site investigation of suspected subsurface petroleum contamination at Bushey's Sunoco, Essex Junction, Vermont (see Site Location Map in Appendix A). Results of the following investigative tasks performed by Griffin International, Inc., (Griffin) are presented:

- ◊ monitoring well installation;
- ◊ site survey;
- ◊ determination of groundwater flow direction and gradient;
- ◊ groundwater sampling and analyses;
- ◊ sensitive receptor survey.

The work for the initial site investigation was performed based on a request from Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Mr. Edward Bitzer of A.R. Sandri, Inc., dated October 30, 1998. Work for the initial site investigation was performed in accordance with the November 8, 1998, *Work Plan and Cost Estimate for Subsurface Investigation of Suspected Petroleum Contamination*, prepared by Griffin. Ms. Sharon Abbott of A.R. Sandri. Inc., gave verbal approval of the work plan in a telephone conversation with Mr. Peter Schuyler of Griffin on November 17, 1998.

II. SITE BACKGROUND

Bushey's Sunoco is located at the eastern intersection of Maple and Railroad Streets, Essex Junction, Vermont (see Site Location Map and Area Map in Appendix A). Topography at the site is generally flat. The property is bounded to the north and east by commercial properties. The subject property is bounded on the west by Railroad Street, across which are a railroad track and commercial properties. The subject property is bounded on the south by Maple Street, across which are residential and commercial properties. The subject property and the surrounding occupied properties are served by a municipal water supply. The site is underlain by pebbly marine sand according to the *Surficial Geologic Map of Vermont* (Ref. 1).

Two 7,600-gallon underground storage tanks (USTs), formerly used to contain gasoline, one 2,000-gallon UST, formerly used to contain gasoline, and one 4,000-gallon UST, formerly used to contain diesel fuel, were closed and replaced at this facility on June 15 and 16, 1998. A UST closure report was subsequently forwarded to the VTDEC UST program by Ms. Abbott (Ref. 2). According to the report, volatile organic compounds (VOCs) were detected in the headspace of soil screening samples collected from the UST excavations at concentrations exceeding the VTDEC Sites Management Section guidance criteria of 20 parts per million for soils associated with a gasoline contamination source. The soils were screened with a Microtip #MP1000 photoionization detector (PID). The USTs were reported to be in excellent or good condition. No holes were reported to have been observed in the USTs. Based on the data obtained during

the UST closure inspection, the contamination observed in the UST excavation was likely to be due to historical spills and overfills in the vicinity of the four USTs. Three replacement USTs were installed: an 8,000-gallon gasoline UST and a 4,000-gallon gasoline UST were installed in the excavation for the two former 7,600-gallon USTs south of the on-site building; and a 4,000-gallon diesel UST was installed in the excavation west of the on-site building in the excavation for the former 4,000-gallon diesel UST.

III. INVESTIGATIVE PROCEDURES

To further define the extent of subsurface petroleum contamination in the area of Bushey's Sunoco, the following additional investigative tasks were undertaken as per the November 8, 1998, Work Plan: installation of five monitoring wells; site survey; determination of groundwater flow direction and gradient; groundwater sampling and analyses for petroleum-related constituents; and an evaluation of sensitive receptors.

A. Monitoring Well Installation

On May 12, 1999, five shallow monitoring wells were installed at the site (see Site Map in Appendix A). The boreholes were installed utilizing hollow-stem auger drilling methods. T&K Drilling, of Troy, New Hampshire, installed the wells under the direct supervision of a Griffin geologist. During borehole advancement, soil samples were collected from every five foot run. Soils were screened for VOCs using an HNu™ Model PI-101 PID using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards. Soil characteristics and headspace concentrations were recorded by the geologist in detailed well logs which are presented in Appendix B. MW1 was installed east of the Bushey's garage in a presumed upgradient direction from the former UST locations. MW2 was installed in a presumed downgradient direction from the gasoline pump island. MW3 was installed in a presumed downgradient direction from the former location of the two 7,600-gallon gasoline USTs. MW4 was installed in a presumed downgradient direction from the former location of the 4,000-gallon diesel UST, the 2,000-gallon gasoline UST, and the diesel pump island. MW5 was installed in the immediate vicinity of the former 4,000-gallon diesel UST and the 2,000-gallon gasoline UST.

Wells were completed with 2-inch diameter, Schedule 40 PVC riser and factory-slotted screened intervals (0.010-inch slots). A silica sand pack was installed in the annular space surrounding the screened interval. The sand pack was brought to approximately two feet above the top of the screened interval in each well. A bentonite seal a minimum of 1 foot thick was installed in the annular space immediately above the sand pack. Each of the wells were completed with a flush-mounted road box and secured with a compression cap.

The soils encountered in the soil borings consisted of light brown to olive to grayish brown sand with local silt and gravel from grade to approximately 17 feet below grade. Groundwater was

encountered at a depth of approximately 11 feet below grade in these five on-site wells during drilling. VOCs were detected in the headspace of soil samples collected from the MW1 at concentrations ranging from 0.1 to 18.2 parts per million volume (ppmv). A minor petroleum odor was observed in the soil sample collected from the initial 5 feet of this borehole. VOCs were detected in the headspace of soil samples collected from MW2 at 10 to 17 feet below grade at concentrations ranging from 5.4 to 31 ppmv. Minor petroleum odors were observed in the soil samples collected from 10 feet to 12 feet below grade and 15 feet to 17 feet below grade in this borehole. VOCs were detected in the headspace of the soil samples collected from MW3 at concentrations ranging from 2.3 ppmv, in the sample from grade to 5 feet below grade, to 54 ppmv in the soil sample collected from 10 feet to 12 feet below grade. A petroleum odor was observed in the soil samples from 10 feet to 12 feet below grade and 15 feet to 17 feet below grade. VOCs were detected in the headspace of soil samples collected from the MW4 at concentrations ranging from 0.1 to 104 ppmv. Petroleum odors were observed in the soil sample from 10 feet to 12 feet below grade in this borehole. VOCs were detected in the headspace of soil samples collected from the MW5 at concentrations ranging from 83 to 310 ppmv. Petroleum odors were observed in all of the soil samples from this borehole.

The sediments encountered in these five soil borings were consistent with the interpretation of the *Surficial Geologic Map of Vermont* (Ref. 1).

B. Determination of Groundwater Flow Direction and Gradient

The five wells were located in azimuth and elevation for inclusion on the Site Map presented in Appendix A. The top of PVC casing in MW1 was assigned an arbitrary elevation of 100.00 feet. The locations of the maintenance garage building and other significant site features were surveyed for inclusion on this Site Map.

Prior to groundwater sampling on May 19, 1999, all five on-site monitoring wells were monitored for presence of free floating product and depths to water. Results are tabulated as Liquid Level Monitoring Data in Appendix C. No free-phase product was observed in any of the five on-site monitoring wells on May 19, 1999. For each well, the measured depth to water was subtracted from the surveyed elevation of the measurement reference point to determine the water table elevation. Water table elevations were plotted on the site map to generate the Groundwater Contour Map presented in Appendix A. From this figure it can be seen that the groundwater flow is directed generally to the south toward a local tributary of the Winooski River at an approximate gradient of 0.9%.

C. Groundwater Sampling and Analyses

A groundwater sample was collected from the five monitoring wells, using disposable bailers, on May 19, 1999. Groundwater samples were analyzed by Endyne, Inc., laboratory of Williston, Vermont. The samples from all five wells were analyzed via by EPA Method 8021B for

petroleum-related VOCs. The samples from MW2, MW4, and MW5 were also analyzed via EPA Method 8015B for total petroleum hydrocarbons (TPHs), diesel range organics (DRO). Quality Assurance/ Quality Control (QA/QC) samples (a trip blank and duplicate sample) were also collected and analyzed via EPA Method 8021B. Analytical results are summarized in tabular form in Appendix D. The applicable groundwater standards are provided for reference in this summary table. Appendix D also contains the analytical laboratory reports. Analytical results of the trip blank and duplicate sample indicate that adequate Quality Assurance/ Quality Control was maintained throughout sample collection and analyses.

MTBE and naphthalene were detected in the sample collected from MW1 on May 19, 1999, at concentrations below the applicable Vermont Groundwater Enforcement Standards (VGES) for these compounds. No other VOCs were detected in the sample collected from MW1 on this date. Ethylbenzene, xylenes, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene were detected in the samples collected from MW2 and MW3 on May 19, 1999, at concentrations above the applicable VGES for those compounds. Toluene was also detected in MW3 in the sample collected on May 19, 1999, at a concentration below the VGES for this compound. Toluene, ethylbenzene, xylenes, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in the sample collected from MW4 on May 19, 1999, at concentrations above the applicable VGES for those compounds. Toluene, ethylbenzene, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in the sample collected from MW5 on May 19, 1999, at concentrations above the applicable VGES for those compounds. Xylenes were detected in the sample collected from MW5 on May 19, 1999, at a concentration below the applicable VGES. TPHs were detected in the samples collected from MW2, MW4, and MW5 on May 19, 1999. There is no VGES for TPHs.

The total VOC concentrations detected in the samples collected from the monitoring wells on May 19, 1999, were plotted on the site map to generate the Contaminant Concentration Map in Appendix A.

IV. EVALUATION OF POTENTIALLY SENSITIVE RECEPTORS

The following potentially sensitive receptors in the vicinity of Bushey's Sunoco site were identified:

- the existing Bushey's Sunoco building,
- the commercial and residential properties in the immediate vicinity of the Site
- the first order tributary to the Winooski River, located approximately 1,500 feet south-southwest of the former

Risks of vapor impact to the existing Bushey's Sunoco building were determined to be minimal because the building is built with a slab on grade. Therefore, the Bushey's Sunoco building was not screened for VOCs with a PID. The basement of the commercial property north of the site

was screened for VOCs with a Microtip #MP1000 PID during the UST closure. As reported in the UST closure report, no vapors were detected in this building at that time (Ref. 2). Based on the soil screening data from the soil borings advanced for monitoring well installation, there apparently has been minimal impact to soils above the water table outside the immediate vicinity of the former UST excavations.

No impacts due to the presence of vapors in the properties south of the subject site have been reported to date. However, based on the available data, the downgradient extent of contamination has not been defined. Given the significant distance from the site to the Winooski River tributary that is south of the site, the current risks posed to this surface water body are likely to be minimal.

Given that the depth of burial of water-bearing utilities is typically 6 feet below grade and the depth to groundwater at this site is approximately 11 feet below grade, it is unlikely that the presence of the on-site utility corridors are a preferential route of migration for dissolved phase contamination.

The presence or absence of vapor phase contamination along utility corridors has not been assessed with field techniques. However, given the typical permeability of the on-site sandy soils, it is unlikely that utility corridors would be a preferential route for the migration of vapor phase contamination.

V. CONCLUSIONS

Based upon the results of the above investigative tasks, Griffin presents the following conclusions:

1) Based on the soil screening data from the UST removal, and the screening and laboratory analytical data from this investigation, it appears likely that the contamination at the site is the result of historical spills and overfills associated with filling the gasoline and diesel USTs formerly located at the site. These USTs were removed from the site on June 15 and 16, 1998.

2) Five monitoring wells were installed to approximately 17 feet below grade on May 12, 1999.

3) Based on the screening results from monitoring well installation, adsorbed-phase contamination is present in the vadose zone at the site in the immediate vicinity of MW5, which was installed in the area of the former 2,000-gallon gasoline UST excavation.

4) Groundwater was encountered at an approximate average depth of 11 feet below grade on May 19, 1999. Based on the groundwater elevations measured on May 19, 1999, groundwater flows to the south at an approximate gradient of 0.9%.

5) No free-phase product was observed in any of the five on-site monitoring wells on May 19, 1999.

6) Dissolved petroleum -related compounds were detected at elevated levels in four of the five on-site wells (MW2, MW3, MW4, and MW5). The concentration of select petroleum-related VOCs in these four wells exceeded the applicable groundwater standards for the applicable compounds. MTBE and naphthalene were detected in the sample collected from MW1 on May 19, 1999, at concentrations below the applicable VGES for these compounds. It is expected that dissolved petroleum constituent concentrations will decrease over time with the progressive action of natural mitigative processes, including biodegradation, dispersion, and dilution.

7) Risks posed to potentially sensitive receptors in the vicinity of Bushey's Sunoco appear minimal, based on currently available data.

8) Based on the available data, the downgradient extent of contamination has not been defined.

VI. RECOMMENDATIONS

Based upon the above conclusions, Griffin recommends the following additional work. To track migration of subsurface petroleum constituents at the site and document expected reductions in constituent concentrations, groundwater from the on-site wells should be sampled and analyzed on a quarterly basis for one year. Samples should be analyzed by EPA Method 8021B for presence of petroleum-related VOCs. In addition, the basements of buildings immediately south of Bushey's Sunoco, if they exist, should be screened with a PID.

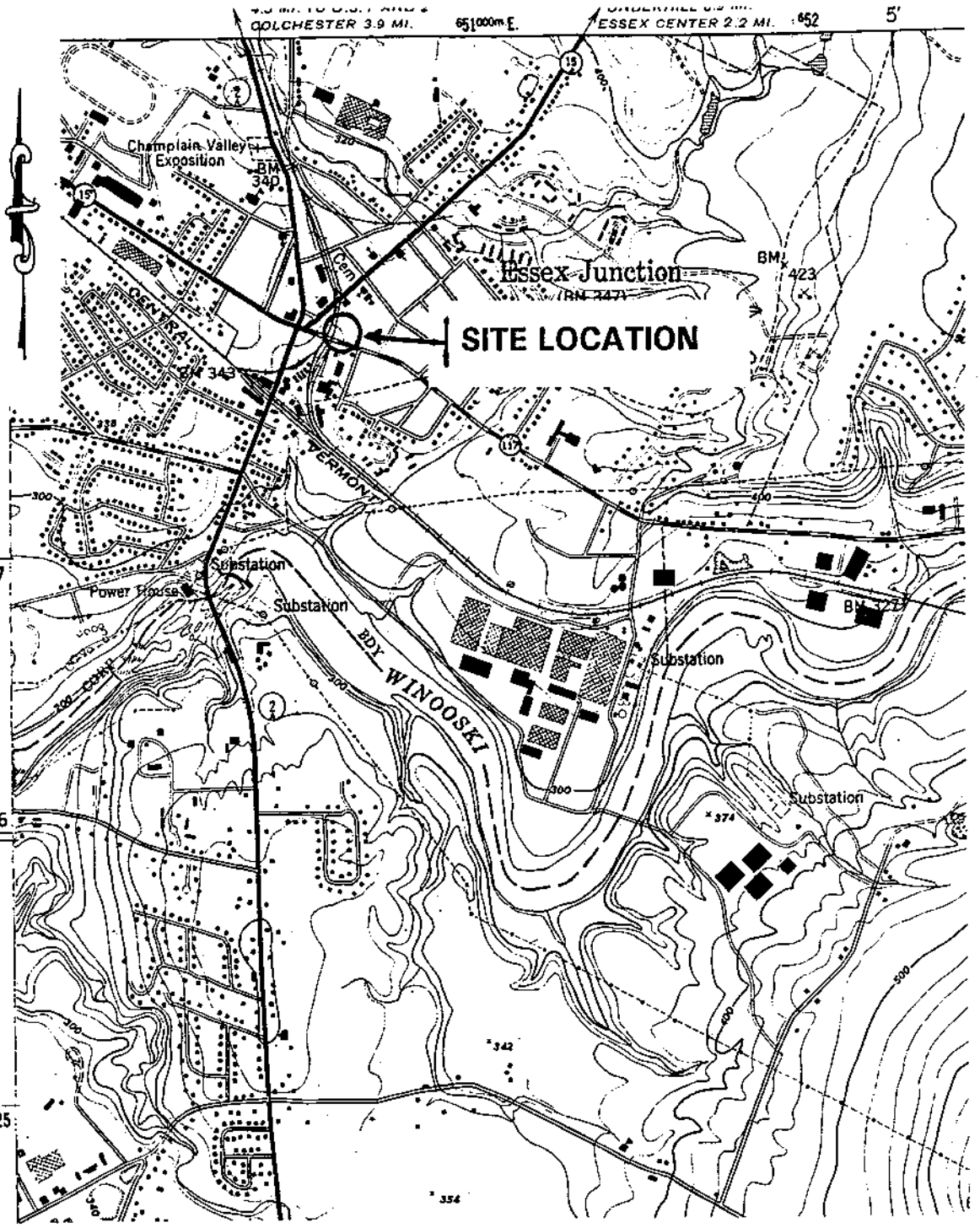
VII. REFERENCES

1. Doll, Charles G., D.P. Stewart, and P. MacClintock, eds., 1970, *Surficial Geologic Map of Vermont*, State of Vermont.

2. A.R. Sandri, Inc., June 22, 1998, Removal Report, Underground Storage Tanks at: Bushey's Sunoco, Facility #385, 16 Maple Street, Essex Junction, VT.

APPENDIX A

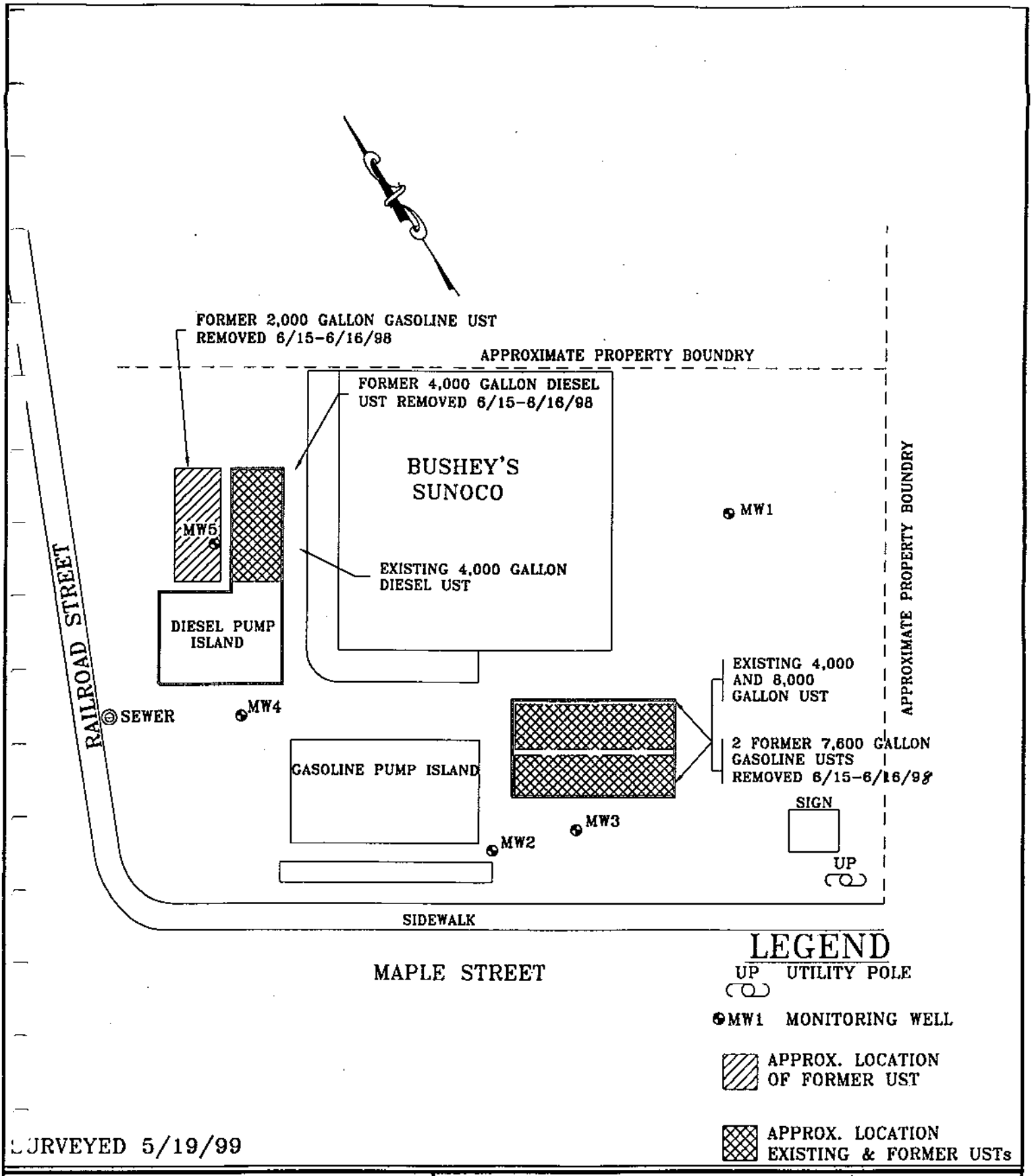
Site Maps



GRIFFIN INTERNATIONAL

SITE LOCATION MAP

BUSHEY'S SUNOCO
ESSEX JUNCTION, VERMONT
Essex Junction (1987), VT., USGS
QUADRANGLE MAP
1 : 24,000
1" = 2,000'



SURVEYED 5/19/99

JOB# 119841413

GRIFFIN INTERNATIONAL INC

BUSHEY'S SUNOCO

ESSEX JUNCTION, VERMONT

SITE MAP

DATE: 6/18/99	DWG.#:1	SCALE: 1"=25'	DRN.:TG	APP.:TK

GRIFFIN INTERNATIONAL Inc
20 Commerce Street
P.O. Box 943
Williston, VT 05495
Ph/Fax (802) 865-4288
E-mail: griffint@together.net

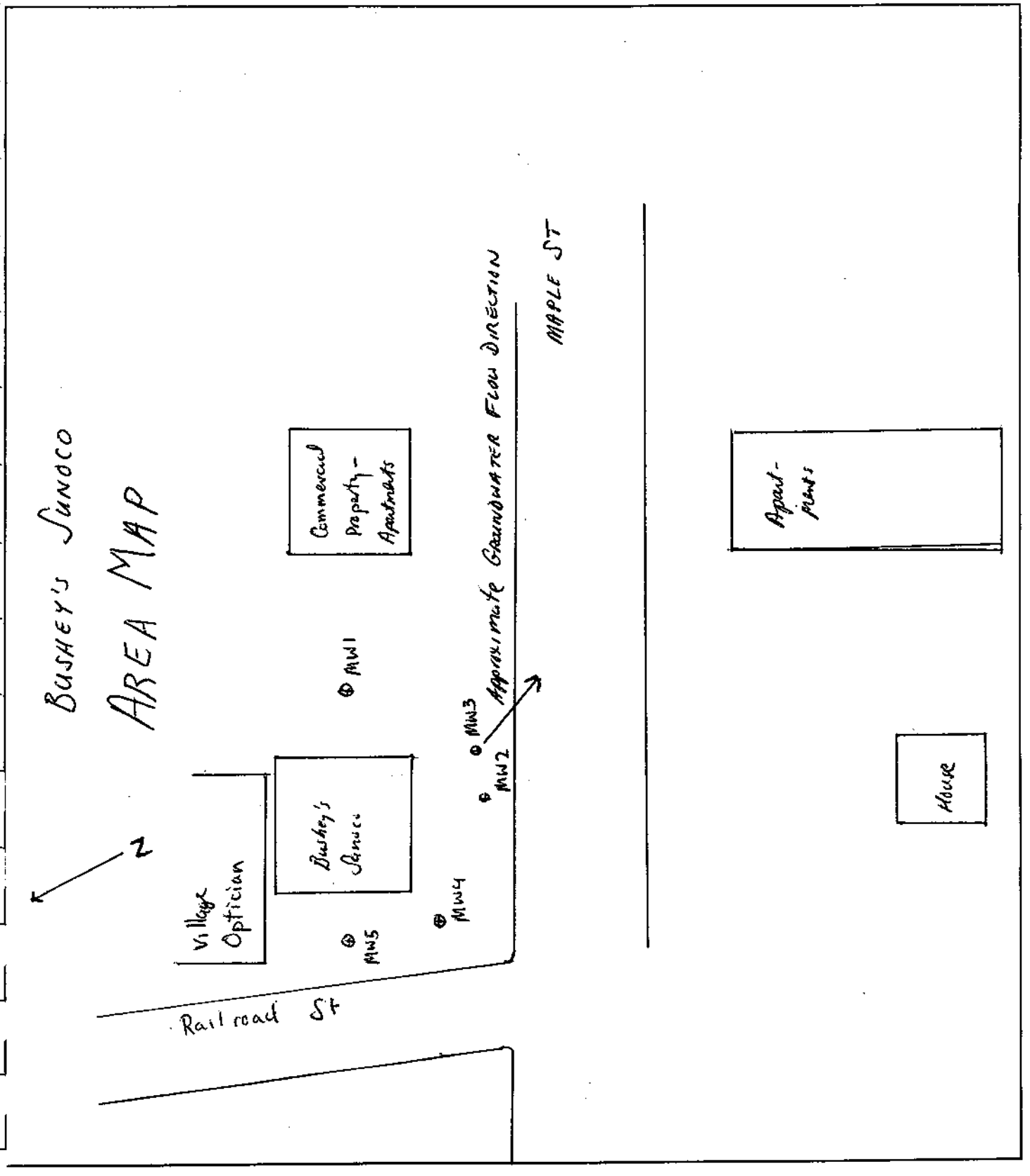
JOB 11984413

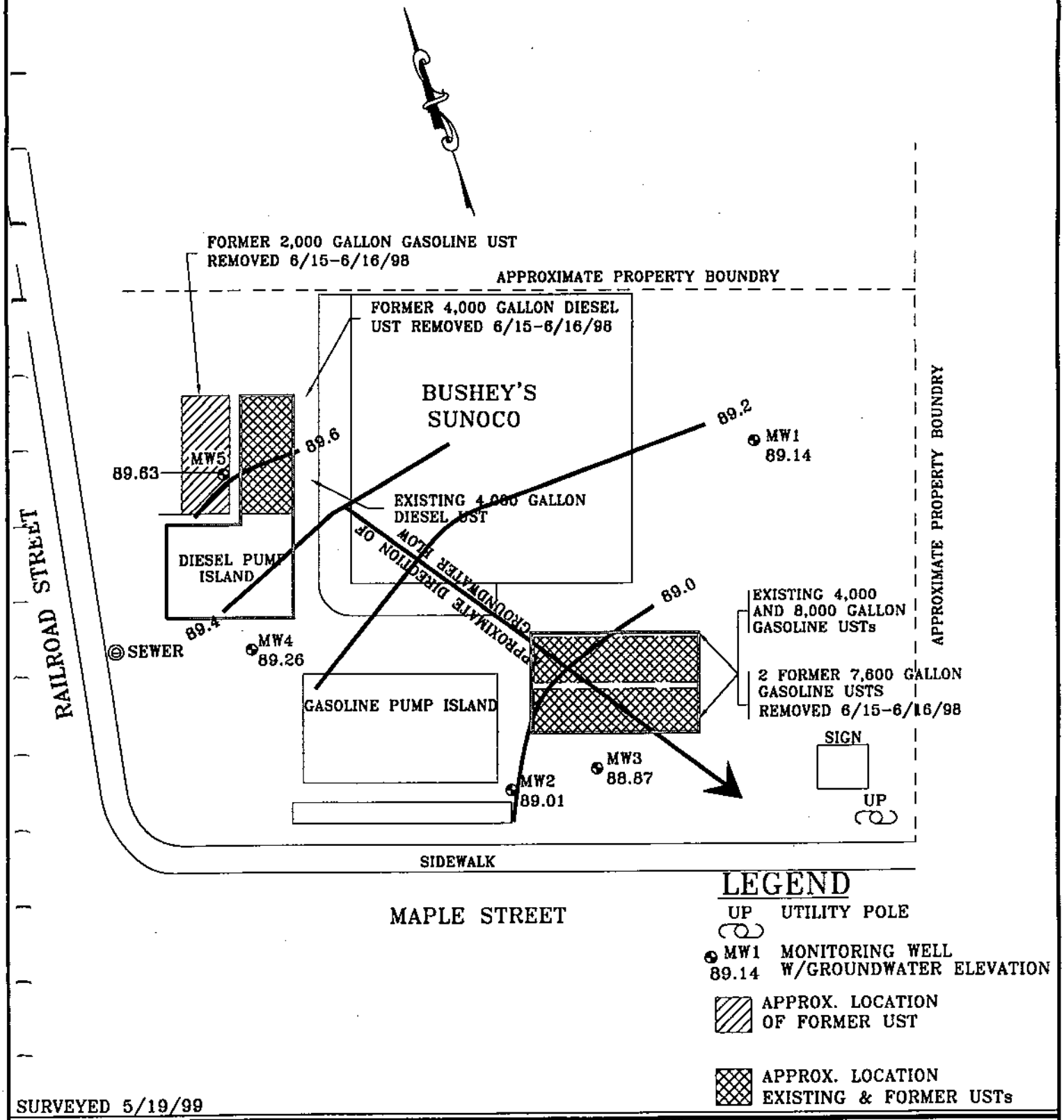
SHEET NO. 1 OF 1

CALCULATED BY — DATE —

CHECKED BY — DATE 8/18/99

SCALE 1" = ~50'





SURVEYED 5/19/99

JOB# 119641413

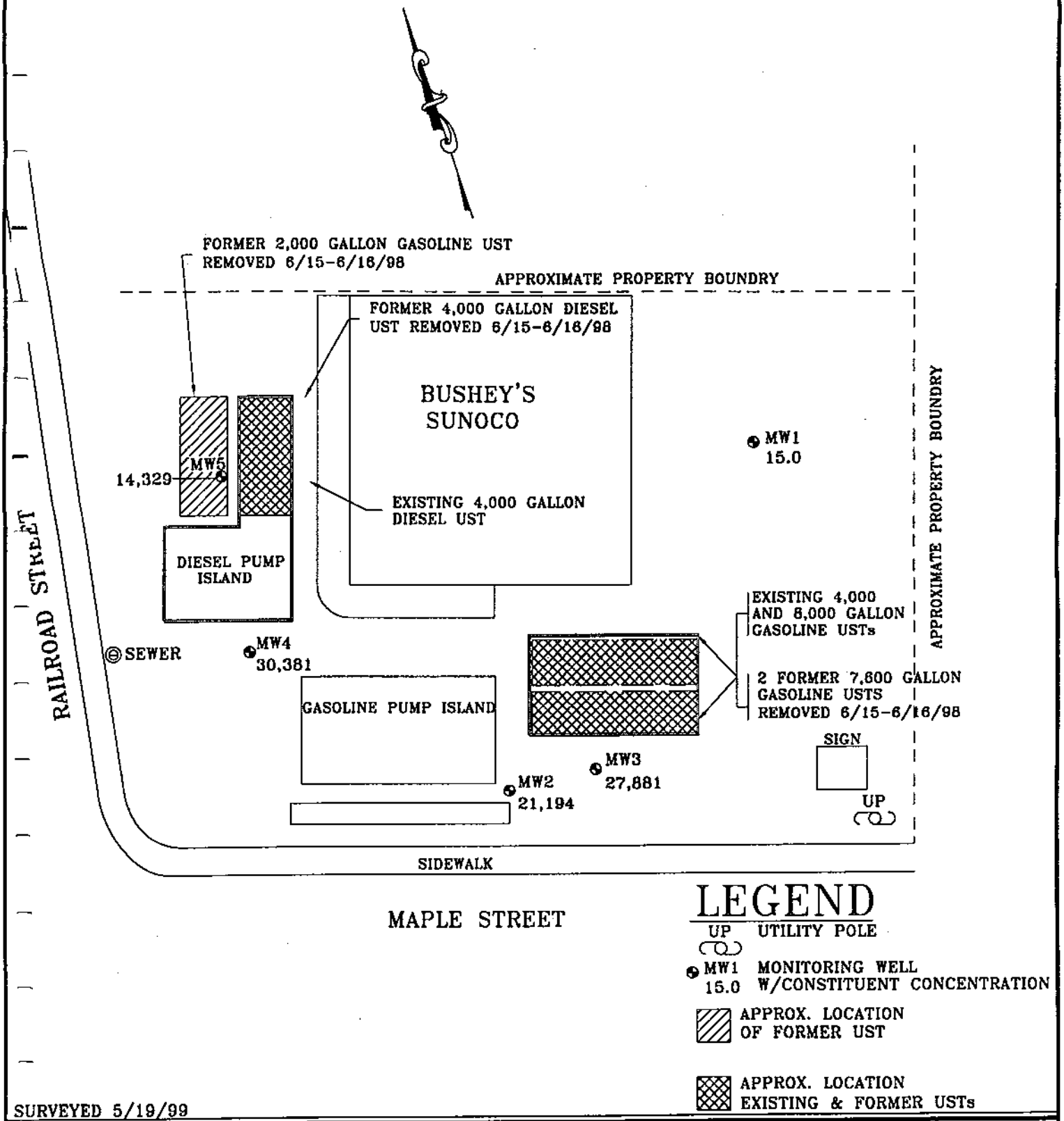
GRIFFIN INTERNATIONAL INC

BUSHEY'S SUNOCO

ESSEX JUNCTION, VERMONT

GROUNDWATER CONTOUR MAP
MEASURED 5/19/99

DATE: 8/14/99	DWG.#:1	SCALE: 1"=25'	DRN.:JL	APP.:TK



LEGEND

UP UTILITY POLE

MW1 15.0 MONITORING WELL W/CONSTITUENT CONCENTRATION

APPROX. LOCATION OF FORMER UST

APPROX. LOCATION EXISTING & FORMER USTs

SURVEYED 5/19/99

JOB# 119841413

GRIFFIN INTERNATIONAL INC

BUSHEY'S SUNOCO

ESSEX JUNCTION, VERMONT

TOTAL TARGETED VOC CONCENTRATION MAP
SAMPLED 5/19/99

DATE: 8/14/99	DWG.#:1	SCALE: 1"=25'	DRN.:JL	APP.:TK

APPENDIX B

Monitoring Well Logs

PROJECT 119841413 BUSHEY'S SUNOCO

LOCATION ESSEX JUNCTION, VERMONT

DATE DRILLED 5/12/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 2.5"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

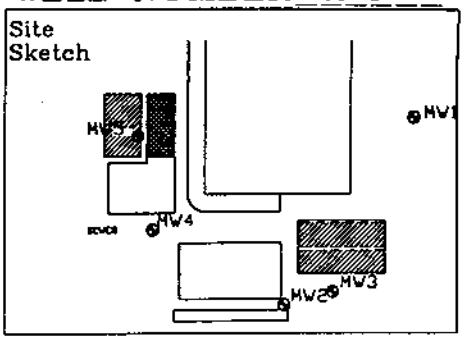
CASING DIA. 2" LENGTH 6.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING DRILLING METHOD HSA

DRILLER A. TOMMILA LOG BY TIM KELLY

WELL NUMBER MW1

Site Sketch



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DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE			0
1		NATIVE BACKFILL	0–5' 18.2 ppm	SILTY SAND (SM)– moist, light brown, logged from auger cuttings	1
2					2
3					3
4		BENTONITE			4
5					5
6		WELL RISER	5'–7'– 3,4,7,7 0 ppm 24/15	WELL–GRADED SAND (SW)– moist, light brown	6
7					7
8					8
9		SAND PACK			9
10					10
11				11' WATER TABLE	11
12		WELL SCREEN	10'–12'– 6,9,10,11 0.1 ppm 24/17	WELL–GRADED SAND (SW)– wet, medium brown	12
13					13
14					14
15					15
16		BOTTOM CAP	15'–17'– 6,6,4,7 0.1 ppm 24/11	WELL–GRADED SAND (SW)– wet, grayish brown	16
17		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 17' END OF EXPLORATION AT 17'	17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT 119841413 BUSHEY'S SUNOCO

LOCATION ESSEX JUNCTION, VERMONT

DATE DRILLED 5/12/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 2.5"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

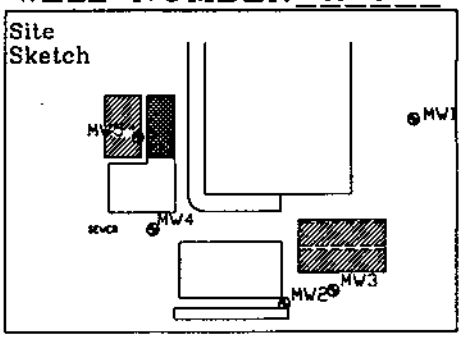
CASING DIA. 2" LENGTH 6.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING DRILLING METHOD HSA

DRILLER A. TOMMILA LOG BY TIM KELLY

WELL NUMBER MW2

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE			0
1		NATIVE BACKFILL			1
2			0-5' 0 ppm	SILTY SAND (SM)- moist, dark to light brown, logged from auger cuttings, asphalt 0-2"	2
3					3
4		BENTONITE			4
5					5
6		WELL RISER	5'-7'- 5,9,8,8 0 ppm 24/18	WELL-GRADED SAND (SW)- moist, light brown	6
7					7
8					8
9		SAND PACK			9
10					10
11				11' WATER TABLE	11
12		WELL SCREEN	10'-12'- 8,6,6,6 31 ppm 24/17	WELL-GRADED SAND W/SILT (SW-SM)- wet, light brown-grayish brown, fine to medium sand at 10-11', coarse to fine sand at 11-12'	12
13					13
14					14
15					15
16		BOTTOM CAP	15'-17'- 1,2,3,8 5.4 ppm 24/14	WELL-GRADED SAND W/SILT (SW-SM)- wet, grayish brown	16
17		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 17' END OF EXPLORATION AT 17'	17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT 119841413 BUSHEY'S SUNOCO

LOCATION ESSEX JUNCTION, VERMONT

DATE DRILLED 5/12/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 2.5"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

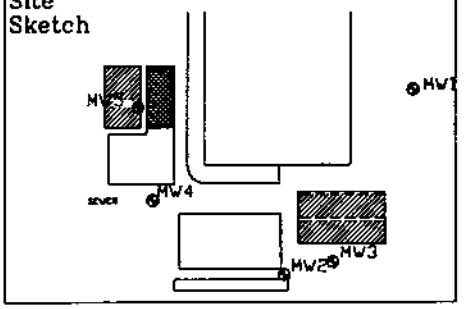
CASING DIA. 2" LENGTH 6.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING DRILLING METHOD HSA

DRILLER A. TOMMILA LOG BY TIM KELLY

WELL NUMBER MW3

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE			0
1		NATIVE BACKFILL			1
2			0-5' 2.3 ppm	SILTY SAND (SM)- moist, olive gray, logged from auger cuttings	2
3					3
4		BENTONITE			4
5					5
6		WELL RISER	5'-7'- 3,9,11,11 0 ppm 24/15	SILTY SAND (SM)- moist, light brown	6
7					7
8					8
9		SAND PACK			9
10					10
11				11' WATER TABLE	11
12		WELL SCREEN	10'-12'- 4,7,6,11 54 ppm 24/15	WELL-GRADED SAND (SW)- wet, olive brown	12
13					13
14					14
15					15
16		BOTTOM CAP	15'-17'- 1,1,4,5 31 ppm 24/12	SILTY SAND (SM)- wet, olive brown	16
17		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 17' END OF EXPLORATION AT 17'	17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT 119841413 BUSHEY'S SUNOCO

LOCATION ESSEX JUNCTION, VERMONT

DATE DRILLED 5/12/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 2.5"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

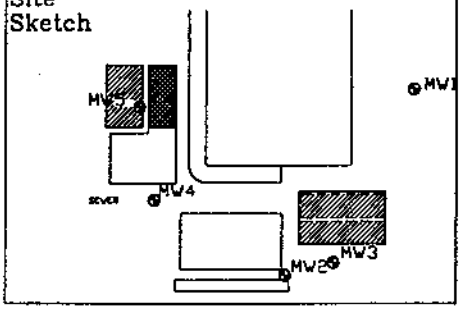
CASING DIA. 2" LENGTH 6.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING DRILLING METHOD HSA

DRILLER A. TOMMILA LOG BY TIM KELLY

WELL NUMBER MW4

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX			0
		LOCKING WELL CAP			
		CONCRETE			
1		NATIVE BACKFILL			1
2			0–5' 4.2 ppm	SILTY SAND w/GRAVEL (SM)– moist, olive, asphalt 0–3", logged from auger cuttings	2
3					3
4		BENTONITE			4
5					5
6		WELL RISER	5'–7'– 3,6,8,12 0.1 ppm 24/18	WELL GRADED SAND (SW)– moist, light brown	6
7					7
8					8
9		SAND PACK			9
10					10
11				11' WATER TABLE	11
12		WELL SCREEN	10'–12'– 4,5,6,9 104 ppm 24/15	WELL-GRADED SAND (SW)– wet, grayish brown	12
13					13
14					14
15					15
16		BOTTOM CAP	15'–17'– 1,3,4,4 0.2 ppm 24/15	WELL GRADED SAND w/SILT (SW–SM)– wet, grayish brown	16
17		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 17' END OF EXPLORATION AT 17'	17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT 119841413 BUSHEY'S SUNOCO

LOCATION ESSEX JUNCTION, VERMONT

DATE DRILLED 5/12/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 2.5"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

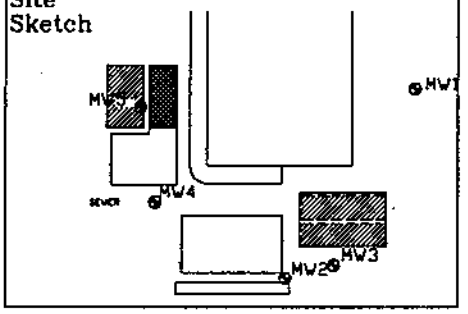
CASING DIA. 2" LENGTH 6.5' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING DRILLING METHOD HSA

DRILLER A. TOMMILA LOG BY TIM KELLY

WELL NUMBER MW5

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE			0
1		NATIVE BACKFILL	0–5' 83 ppm	SILTY SAND (SM)– moist, dark gray, asphalt 0–3", logged from auger cuttings	1
2					2
3					3
4		BENTONITE			4
5					5
6		WELL RISER	5'–7'– 2,2,3,2 270 ppm 24/14	SILTY SAND (SM)– moist, gray-olive	6
7					7
8					8
9		SAND PACK			9
10					10
11				11' WATER TABLE	11
12		WELL SCREEN	10'–12'– 2,6,7,9 310 ppm 24/15	WELL-GRADED SAND (SW)– wet, light grayish brown	12
13					13
14					14
15					15
16		BOTTOM CAP	15'–17'– 0,1,5,6 163 ppm 24/13	WELL GRADED SAND (SW)– wet, grayish brown	16
17		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 17' END OF EXPLORATION AT 17'	17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

APPENDIX C

Liquid Level Data, May 19, 1999

Liquid Level Monitoring Data, Bushey's Sunoco
Essex Junction, VT

Monitoring Date: 5-19-99

Well I.D.	Top of Casing Elevation	Depth to Product	Depth to Water	Water Table Elevation
MW-1	100.00	-	10.86	89.14
MW-2	99.63	-	10.62	89.01
MW-3	99.48	-	10.61	88.87
MW-4	99.84	-	10.58	89.26
MW-5	100.42	-	10.79	89.63

Note: All values reported in feet. Surveyed 5/19/99.
NM = Not Measured

APPENDIX D

Groundwater Quality Data, May 19, 1999

Summary of Groundwater Quality Data, Bushey's Sunoco
Essex Junction, VT

PARAMETER	5-19-99 MW1	MW2	MW3	MW4	MW5	VGES
Benzene	ND(1)	ND(100)	ND(100)	ND(100)	ND(100)	5
Toluene	ND(1)	ND(100)	**133.**	**3,920**	**780.0**	1000
Ethylbenzene	ND(1)	**3,610**	**2,850**	**3,010**	**956.0**	700
Xylenes	ND(1)	**16,900**	**12,300**	**21,800**	**5,390.0**	10000
Total BTEX	ND(1)	**20,510.**	**15,283.**	**25,730.**	**8,126.0**	-
MTBE	**12.7**	ND(1000)	ND(1000)	ND(1000)	ND(1000)	40
1,3,5-Trimethylbenzene	ND(1)	**1,580**	**1,350**	**1,040**	**1,590**	4
1,2,4-Trimethylbenzene	ND(1)	**4,980**	**4,030**	**3,090**	**4,270**	5
Naphthalene	**2.3**	**811**	**541**	**1,520**	**344**	20
Total Targeted VOCs	**15.0**	**21,194.**	**27,881.**	**30,381.**	**14,329.**	-
TPHs (mg/L)	**NA**	**29.5**	**NA**	**68.3**	**30.7**	

All values reported in ug/L (ppb) unless otherwise noted.

Detections are Bold

Values greater than the applicable Vermont Groundwater Enforcement Standard (VGES) are shaded

NA - Not Analyzed

ND(1000) - Not Detected (Detection Limit)

TBQ(1) - Trace Below Quantitation Limit (Detection Limit)

119841413

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Bushey's Sunoco/119841413
REPORT DATE: June 2, 1999
DATE SAMPLED: May 19, 1999

ORDER ID: 2412
REF.#: 138,749 - 138,755

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Bushey's Sunoco/119841413
CLIENT PROJ. #: 119841413

DATE RECEIVED: May 20, 1999
REPORT DATE: June 2, 1999
ORDER ID: 2412

Ref. #:	138,749	138,750	138,751	138,752	138,753
Site:	Trip Blank	MW 1	MW 3	MW 2	MW 4
Date Sampled:	5/19/99	5/19/99	5/19/99	5/19/99	5/19/99
Time Sampled:	8:05	9:57	10:36	11:00	11:27
Sampler:	TK	TK	TK	TK	TK
Date Analyzed:	5/28/99	5/28/99	6/1/99	6/1/99	6/1/99
UIP Count:	0	>10	>10	>10	>10
Dil. Factor (%):	100	100	1	1	1
Surr % Rec. (%):	92	93	110	99	99
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
MTBE	<10	12.7	<1000	<1000	<1000
Benzene	<1	<1	<100	<100	<100
Toluene	<1	<1	133.	<100	8,920.
Ethylbenzene	<1	<1	2,850.	3,610.	3,010.
Xylenes	<1	<1	12,300.	16,900.	13,800.
1,3,5 Trimethyl Benzene	<1	<1	1,350.	1,580.	1,040.
1,2,4 Trimethyl Benzene	<1	<1	4,030.	4,980.	3,090.
Naphthalene	<1	2.3	531.	811.	521.

Ref. #:	138,754	138,755			
Site:	MW 5	Duplicate			
Date Sampled:	5/19/99	5/19/99			
Time Sampled:	11:50	12:36			
Sampler:	TK	TK			
Date Analyzed:	6/1/99	6/1/99			
UIP Count:	>10	>10			
Dil. Factor (%):	1	1			
Surr % Rec. (%):	102	98			
Parameter	Conc. (ug/L)	Conc. (ug/L)			
MTBE	<1000	<1000			
Benzene	<100	<100			
Toluene	1,780.	134.			
Ethylbenzene	956.	2,830.			
Xylenes	5,390.	12,200.			
1,3,5 Trimethyl Benzene	1,590.	1,590.			
1,2,4 Trimethyl Benzene	4,270.	4,530.			
Naphthalene	343.	593.			

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

1198414 13

Project Name: Bushey's Sunoco Site Location: Essex Jct. VT	Reporting Address: Griffin	Billing Address: Griffin
Endyne Project Number: 2412	Company: Griffin Contact Name/Phone #: Tim Kelly	Sampler Name: T. Kelly Phone #: 865-4758

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 5/17/13	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
138749	Trip blank	water	X		0805		40 mL		8021B	HCl	
138750	MW1				0957				8021B		
138751	MW3				1036				8021B		
138752	MW2				1100				8021B 8100 TPH		
138753	MW4				1124				8021B 8100 TPH		
138754	MW5				1150				8021B 8100 TPH		
138755	Dup				1056				8021B		

Relinquished by: Signature	Received by: Signature	Date/Time 5-17-13 10:05
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

1198 41413

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Bushey's Sunoco/119841413
REPORT DATE: June 2, 1999

ORDER ID: 2412
DATE RECEIVED: May 20, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

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Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Bushey's Sunoco/119841413
CLIENT PROJ. #: 119841413

DATE RECEIVED: May 20, 1999
REPORT DATE: June 2, 1999
ORDER ID: 2412

Ref. #:	138,749	138,750	138,751	138,752	138,753
Site:	Trip Blank	MW 1	MW 3	MW 2	MW 4
Date Sampled:	5/19/99	5/19/99	5/19/99	5/19/99	5/19/99
Time Sampled:	8:05	9:57	10:36	11:00	11:27
Sampler:	TK	TK	TK	TK	TK
Date Analyzed:	5/28/99	5/28/99	6/1/99	6/1/99	6/1/99
UIP Count:	0	>10	>10	>10	>10
Dil. Factor (%):	100	100	1	1	1
Surr % Rec. (%):	92	93	110	99	99
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
MTBE	<10	12.7	<1000	<1000	<1000
Benzene	<1	<1	<100	<100	<100
Toluene	<1	<1	133.	<100	8,920.
Ethylbenzene	<1	<1	2,850.	3,610.	3,010.
Xylenes	<1	<1	12,300.	16,900.	13,800.
1,3,5 Trimethyl Benzene	<1	<1	1,350.	1,580.	1,040.
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Naphthalene	<1	2.3	531.	811.	521.

Ref. #:	138,754	138,755
Site:	MW 5	Duplicate
Date Sampled:	5/19/99	5/19/99
Time Sampled:	11:50	12:36
Sampler:	TK	TK
Date Analyzed:	6/1/99	6/1/99
UIP Count:	>10	>10
Dil. Factor (%):	1	1
Surr % Rec. (%):	102	98
Parameter	Conc. (ug/L)	Conc. (ug/L)
MTBE	<1000	<1000
Benzene	<100	<100
Toluene	1,780.	134.
Ethylbenzene	956.	2,830.
Xylenes	5,390.	12,200.
1,3,5 Trimethyl Benzene	1,590.	1,590.
1,2,4 Trimethyl Benzene	4,270.	4,530.
Naphthalene	343.	593.

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

11984413

CHAIN-OF-CUSTODY RECORD

Project Name: Bailey's Sunoco Site Location: Essex Jct, VT	Reporting Address: Griffin	Billing Address: Griffin
Endyne Project Number: 2412	Company: Griffin Contact Name/Phone #: Tim Kelly	Sampler Name: T. Kelly Phone #: 863-4788

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 5/19/94	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
138749	Trip blank	water	X		0805		40 ml		8021B	HCl	
138750	MW1				0957				8021B		
138751	MW3				1036				8021B		
138752	MW2				1100				8021B 8100 TPH		
138753	MW4				1124				8021B 8100 TPH		
138754	MW5				1150				8021B 8100 TPH		
138755	Dup				1036				8021B		

Relinquished by: Signature [signature] Received by: Signature [signature] Date/Time 5-20-94 10:05

Relinquished by: Signature [signature] Received by: Signature [signature] Date/Time 5/20/94 11:45

New York State Project: Yes ____ No ✓

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

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LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Bushey's Sunoco/119841413
REPORT DATE: June 2, 1999

ORDER ID: 2412
DATE RECEIVED: May 20, 1999
SAMPLER: TK
ANALYST: 820

Ref. Number: 138752 | Site: MW 2 | Date Sampled: May 19, 1999 | Time: 11:00 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	29.5	mg/L	SW 8015B	6/1/99

Ref. Number: 138753 | Site: MW 4 | Date Sampled: May 19, 1999 | Time: 11:27 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	68.3	mg/L	SW 8015B	6/1/99

Ref. Number: 138754 | Site: MW 5 | Date Sampled: May 19, 1999 | Time: 11:50 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	30.7	mg/L	SW 8015B	6/1/99